

Public Health Services at the 1960 Winter Olympics

RICHARD F. WHITE, M.D., MALCOLM H. MERRILL, M.D., and WILLIAM W. STILES, M.D.

STAGING of the VIII Olympic Winter Games in Squaw Valley, Calif., February 18 through 28, 1960, presented an unusual opportunity for a local health department to adapt its program to a mammoth public event. The contests in skiing and skating drew tens of thousands of persons each day to this previously sparsely inhabited valley. Long and careful preparation was necessary to insure success of the events and to prevent untoward public health emergencies.

Squaw Valley was chosen as the site in June 1955. At that time the valley had only one ski lodge, one ski lift, and a few scattered homes. By February 1960 there had been erected a giant ice skating arena with a seating capacity of 11,000, an oval speed rink 400 meters in length, three practice ice rinks, three chair lifts, several courses for downhill and slalom skiing, four three-story dormitories large enough to house 1,200 athletes and team officials, an athletes' recreation center, two large centers for spectators, and supporting community plant buildings. The existing ski lodge accommodated officials during the games, and most of the housing for spectators was in the Lake Tahoe and Reno areas, within a 10- to 40-mile radius of Squaw Valley.

Dr. White is director of the Placer County Health Department, Auburn, Calif. Dr. Merrill is director of public health for the State of California. Dr. Stiles, professor of public health, University of California School of Public Health, was medical director of the 1960 Olympic Winter Games Organizing Committee.

Squaw Valley is in the Sierra Nevada Mountains of California at an elevation of 6,200 feet. The site was picked because of the superb skiing conditions and the certainty that there would be enough snow for the contests. Financing of the games was underwritten largely by State and Federal Governments, and the facilities have since been turned over to the State of California for a recreational park. Funds were also provided through individual donations and from the sale of tickets. Much of the staff responsible for putting on the games were volunteers from various organizations and industries throughout the United States.

Athletes and team officials began to arrive on February 1, and the number increased until there were more than 1,000 when the events were opened on February 18. After that date the number remained essentially constant. In addition to the athletes and team officials, there were nearly 4,000 resident administrative and ancillary personnel and spectators numbering from 10,000 on a weekday to 47,000 on Sunday.

Public Health Administration

Long in advance of the games, State and local health authorities and the Olympic Organizing Committee, a nongovernmental agency responsible for staging the games, agreed that all public health matters would be handled as nearly as possible in the customary patterns of health administration in California. The health department of Placer County, in which Squaw Valley is located, would maintain legal jurisdiction over all public eating places, waste

disposal, small water systems, and communicable disease control. The California State Department of Public Health would exercise its legal responsibility regarding large water supplies and sanitary features of installations on State-owned land. It would also be available for consultation to both the Placer County Health Department and the Olympic Organizing Committee on all public health questions.

Representatives of these agencies held 12 planning meetings, beginning in December 1958. Some of these were attended also by representatives from the regional water pollution control board, the California State Division of Housing, the Nevada State Health Department, and the health departments of the adjacent counties of El Dorado and Nevada. The meetings dealt initially with basic sanitation and later with housing, preventive medical services, and provision of public health staff during the games. (General medical care was not part of the public health responsibilities.) Cooperation between the State and local health authorities and the medical division of the organizing committee was excellent. The organizing committee provided office space for the local health department staff during February and paid half the cost of their lodging and meals.

Local health department staff resident at the games site for the entire month consisted of two sanitarians for daily inspections of eating places, housing, and other sanitary installations in Squaw Valley and the surrounding area, one public health nurse for work in isolation and investigation of communicable diseases, and a medical officer to direct the health activities and carry out a surveillance program on communicable diseases. A sanitary engineer from the State health department worked periodically at the games, and a reserve force of State health department physicians, nurses, sanitarians, and statisticians stood ready to come in on short notice should a severe disease outbreak or other public health emergency occur. The local public health bacteriology laboratory was available 80 miles away at the county seat, and the State virus laboratory 200 miles away was alerted to receive specimens of suspected viral diseases.

By advance planning and careful budgeting of time and funds the local health department was able to give complete coverage to the

Olympic events without significant sacrifice in existing programs or sizable expenditure of funds. The only special expense was \$875 toward food and lodging of the resident staff.

Environmental Sanitation

As part of the permanent facilities constructed for the Olympic Games, a full-treatment sewage disposal plant costing half a million dollars was erected in the valley. Treatment at this plant, designed for a peak capacity of half a million gallons of sewage a day, consists of primary and secondary sedimentation, biofiltration, and postchlorination with disposal of effluent into a recharge filter 12 feet underground and 100 feet distant from Squaw Creek, the main drainage channel of Squaw Valley.

Squaw Creek is a tributary of the Truckee River, which is a source of domestic water supply for the city of Reno. Because of the sewage treatment plant's proximity, water samples were collected from the creek above and below the plant and tested for coliform bacilli before and again during the games. Except for one weekend when the plant was grossly overloaded, the plant functioned efficiently and no contamination of water occurred.

The more than 100 private homes in Squaw Valley, many of recent construction, were served by individual septic tank disposal systems. All septic tanks were subject to rigorous regulations and inspections by the county health department, and there were no reports of failure during the games. State and local health officials also worked closely with officials of the three sewer districts in the Lake Tahoe area to insure optimum operation during such abnormally heavy winter loading.

Water supply for the main Olympic facilities, except the private ski lodge, was obtained from three cased wells more than 100 feet deep located in the floor of Squaw Valley. Results of frequent bacteriological sampling during the previous year were good; however, chlorination was also provided as an additional safeguard. Chlorine residual was tested daily by the resident sanitarians and ranged from a trace to 0.5 ppm on all days except February 8 and 17, when no residual was found. Breakdown of

the chlorinating equipment and delay in obtaining the necessary parts accounted for the lack of chlorine residual on February 8.

The water supply for the private ski lodge was derived from surface runoff collected from a dam on a tributary of Squaw Creek high on the ski slopes within an unprotected watershed. The local health department was instrumental in getting the owners to install a chlorinating system before the Olympic Games, and the equipment was operating successfully at the beginning of February. On February 7 a heavy rainstorm washed mud and debris into the reservoir and caused temporary failure of the system. Turbid water was detected in this supply for 2 days until negotiations were completed for a temporary connection by fire hose to the main Olympic water supply.

Houses on the floor of the valley were supplied by two mutual water systems using ground sources. These were operated under permit and surveillance of the local health department and were considered safe without chlorination. State and local health officials during the previous year had worked closely with small and large water systems in the Lake Tahoe-Truckee area in order to bring inadequate systems up to a reasonably safe standard. These efforts were generally successful, and many of the systems received permanent improvements.

Food service facilities consisted of a large cafeteria in the athletes' center which could serve 1,000 persons at a time; short-order restaurants at two spectator centers which served sandwiches, hamburgers, soft drinks, and fountain and alcoholic beverages; dining rooms at two private lodges housing officials; and several mobile huts and concession stands serving hot dogs and hot drinks. The restaurants at the spectator centers and the mobile huts were leased to a private concessionaire; the lodge dining rooms were under the usual private managements; and the athletes' cafeteria was under direct operation of the Olympic Organizing Committee. All the eating facilities were operated under permit by the Placer County Health Department, and as a result of excellent cooperation between the organizing committee and the health officials all structural features were satisfactory by the beginning of February.

To insure optimum operation, each food-

processing center was visited daily during the month by a resident sanitarian, but few corrections were necessary. Inspections covered temperature of dishwater and refrigerated storage units, rinse-water disinfecting procedures, food-handling techniques, appearance and cleanliness of food-handling personnel, cleanliness of meat choppers, cutters, and other utensils, protection of storage areas from rodents, and other items of general food sanitation. Larger than normal quantities of food and dishes necessitated use of booster units on the dishwashing apparatus to insure the required 180° F. temperature of the rinse water.

All the restaurants in the surrounding area were inspected at least once in the fall of 1959 and again in January 1960. During February they were visited every 2 to 5 days by a resident sanitarian. Some of the restaurants required a more frequent and more thorough check than others because they were trying to accommodate unusually large numbers of people with relatively antiquated equipment.

Through the combined efforts of the California State Division of Housing and the local health and building departments in the Squaw Valley area, inspection surveys of all public housing facilities were made. The bulk of the inspections, nearly 150, were made by the area representative of the State division of housing. The local building inspectors and sanitarians jointly inspected a smaller number of establishments, including apartment houses, hotels, and ski lodges, which by law are under the jurisdiction of the localities. Specific items checked by sanitarians were window area, general maintenance, exhaust systems, venting of gas heaters, toilet facilities, sewage disposal, storage of garbage and trash, vector control, water supply, food handling, occupancy, and fire hazards.

Inspection reports, submitted well in advance of the games, showed that housing in the area was good. Most of it was of fairly recent construction. The local health department held several meetings regarding room occupancy with the organizing committee, which was guaranteeing housing to spectators at fixed rates and making arrangements for housing certain officials. California State law requires a minimum of 630 cu. ft. for the first two persons

and 500 cu. ft. for each additional person in a sleeping room, but the local health officer may lower the 500-cu. ft. requirement for temporary recreational facilities. After consultation with the communicable disease and housing specialists of the State department of public health, 400 cu. ft. was set as the minimum for all dormitories of the Olympic facilities, as well as rented housing and the three school buildings used for dormitories. With other safeguards, such as staggering of bunks head to foot and a minimum of 3 feet between bunks, this requirement was considered a reasonable balance between the need for health protection and the desire to accommodate as many people as possible.

The resident sanitarians made routine checks of the public housing in the area to make sure the occupancy requirement was met. Overcrowding in one of the converted school buildings had to be corrected by removal of some of the beds to another sleeping area. The sanitarians also checked general housekeeping, trash removal, safety hazards, plumbing, and bedding, but practically no difficulty with these conditions was encountered.

One exception concerned 18 trailers parked behind the ski lodge during the month of February. Connections to the sewer had been hastily and poorly executed, but through persistence of the resident sanitarian satisfactory corrections were finally made.

The organizing committee arranged with the private franchise holders in the area for daily collection of all garbage and trash. Except for a day or two when snow made removal difficult, collection proceeded satisfactorily during the month.

Communicable Disease Control

In February 1959, a year before the games, skiing and skating trials were held in Squaw Valley, using the partly completed Olympic facilities. These events offered an opportunity to test the efficiency of the administrative organization and the soundness of the plant and athletic facilities. They also provided a chance to observe what types of public health problems might be encountered.

The trials took place just as a wave of Asian

influenza began in the United States, and indeed an epidemic of Asian influenza occurred among the contestants and officials at the trials. The outbreak was studied carefully, and after the events a survey was made of nearly all the persons residing in the dormitories. Approximately one out of six was sufficiently ill to report for treatment to a medical aid station, and two out of six reported some illness on survey.

Clearly, an epidemic with a 33 percent attack rate could exert an extremely adverse influence on the course of the games in 1960. Therefore, a full-scale immunization program was planned, and special attention was given to the spacing and configuration of bunks and the amount of airspace per person available in the sleeping quarters.

In November 1959 an immunization program against influenza for officials, employees, and contestants was begun. Through the office of the medical director of the organizing committee, memorandums were sent to all persons officially connected with the Olympic Games advising them to obtain inoculations against influenza from their private physicians. As an added incentive, the organizing committee provided free inoculations in Squaw Valley on December 9, January 6, and February 3 and in San Francisco on December 4 and January 8.

A total of 490 persons received one or more inoculations against respiratory disease at the free clinics. A placebo and three types of vaccine, donated by the Parke-Davis Company, were used: polyvalent influenza vaccine, polyvalent influenza vaccine combined with adenovirus strains 3, 4, and 7, and this combination further combined with two strains of parainfluenza (nine-strain vaccine).

According to data provided by the medical aid stations, 57 of the 490 persons inoculated became ill during February, an attack rate of 7.6 percent. As shown in the table, the differences in attack rates between persons receiving vaccine containing adenovirus and those receiving only influenza vaccine or placebo were extremely small. Assuming that the sample was drawn from a normal population and examining the results by analysis of variance, however, the small observed differences could be shown to be statistically significant.

No data were available for persons who were vaccinated by their private physicians.

Since respiratory illnesses as such are not required by law to be reported in California, it was necessary to arrange special machinery to follow the progress of any respiratory illness which might attack the artificial Olympic community. A surveillance procedure was set in operation on February 1 and was continued through the month. At five medical aid stations in the valley and at the field hospital, special data cards were to be filled out for any person seeking treatment for a respiratory illness. The data included the person's name, home city, local address, age, sex, date of onset, and date of arrival in Squaw Valley, as well as clinical diagnosis. As a double check, all medical records were reviewed daily by the public health physician to insure that no cases of any communicable disease escaped notice. It was thus possible to compare the number of cases of respiratory disease observed with the size of the population at risk at any given time. As the number of Olympic officials, volunteers, and contestants increased from about 1,000 on February 1 to about 5,000 on the opening day of the games, cases of respiratory disease increased from 2 or 3 a day to an average of 25 a day.

With the exception of a slight peak on the weekend of February 22, the amount of respiratory illness was consistently proportional to the number of Olympic officials in the area at the time. About one new case occurred for every

200 persons at risk each day. However, on the basis of the experience during the 1959 trials, which showed that only half the persons ill with respiratory disease presented themselves for treatment, the true incidence in 1960 was probably closer to one new case for every 100 individuals.

Throat washings were collected from five persons showing typical clinical influenza and were tested for influenza by the State virus laboratory. Three of the five were positive for influenza type A2. Two of these patients were U.S. skaters, who had arrived from Seattle, Wash., on February 1 and the third was an Austrian team official, who arrived on February 11.

Altogether there were 425 cases of respiratory disease during February. Only 38 were diagnosed as typical influenza. Two hundred and sixty-four were upper respiratory infection or pharyngitis, and the remaining 175 were such illnesses as streptococcal sore throat, bronchitis, laryngitis, or sinusitis.

Respiratory illness in 1960 appeared to be endemic, in contrast to the experience in 1959 when it was epidemic. Although Asian influenza was present in 1960 from the start of February and cases continued to occur throughout the month, the disease never approached epidemic proportions. Reasons for the contrast with the 1959 experience are not entirely clear. The vaccination experience for the total population at risk is not known, but analysis of the data on the small number vaccinated in the

Respiratory disease among persons vaccinated, by type of vaccine and number of injections

Type of vaccine	One or more injections			One injection			Two injections		
	Total persons	Number ill	Percent ill	Total persons	Number ill	Percent ill	Total persons	Number ill	Percent ill
Total.....	490	37	7.6	265	23	8.7	225	14	6.2
Nine-strain vaccine.....	184	13	7.1	97	9	9.3	87	4	4.6
Polyvalent influenza vaccine with adenovirus strains.....	188	14	7.5	106	8	7.5	82	6	7.3
Polyvalent influenza vaccine.....	61	5	8.2	33	3	9.1	28	2	7.1
Placebo.....	57	5	8.8	29	3	10.3	28	2	7.1

clinics showed only slight, if any, protective effect. It does not appear likely therefore that vaccination alone prevented an outbreak.

There are two factors which may have contributed to the low incidence of influenza in 1960. One is that influenza virus had been well seeded in the State of California and the Reno area before February 1960. In fact, influenza morbidity had reached its peak in California by January 22. In 1959, by contrast, the virus was just starting to appear in the State about the time the trial events were held. The other factor would appear to be a greater dispersion of people in 1960. Whereas in 1959 all those associated with the games slept and took meals in the same place, in 1960 contestants and team officials slept and ate separately from other organizing committee personnel.

Because of the possibility of an unusual prevalence of infectious diarrhea, known to have occurred in this area in the past, as well as of food poisoning outbreaks, every case of gastroenteritis was scrutinized and a system for prompt reporting was devised. Only 42 cases of gastroenteritis were seen during the month. They were spread out in time, averaging about two a day. No more than four cases occurred in any single day. Detailed food histories were obtained on 10 of these cases, and in none was there evidence to suggest a common-source food poisoning outbreak. Imagining the disastrous consequence of a widespread outbreak of food poisoning in such a setting, one might surmise that the preventive health measures were effective.

In addition to respiratory illness and gastro-

enteritis, communicable diseases reported during the month included one case of mumps, one of german measles, and three of trench mouth. Considering the large population at risk and the excellent opportunity for transmission of illness through close association of people from all over the world, the number of cases of communicable diseases was gratifyingly small.

Summary

The 1960 Olympic Winter Games, held in Squaw Valley, Calif., provided a challenge to health authorities to meet the needs for expanded public health services. Sparsely inhabited with few public facilities, the valley had to prepare to house, feed, and amuse some 5,000 contestants and officials and tens of thousands of spectators. With the cooperation and assistance of the State health department and other health agencies in the area, the county health department (Placer County) worked to assure adequate sewage disposal facilities, a safe water supply, satisfactory housing, and sanitary eating places. It also initiated an influenza vaccination program and set up special surveillance procedures for all respiratory diseases.

Only 425 cases of respiratory disease, including 38 cases of influenza, occurred during the month of the games. Gastroenteritis, also of major concern in a setting such as this, was limited to 42 cases, with never more than 4 in a day. The low incidence of these as well as all other communicable diseases attests to the success of the efforts in environmental health and communicable disease control.